



AF 527

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	Application No.	10/815,607	
	Filing Date	March 31, 2004	
	First Named Inventor	James Christopher Matayabas, Jr.	
	Art Unit	1752	
	Examiner Name	Geraldina Visconti	
Total Number of Pages in This Submission	27	Attorney Docket Number	42P18765

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form  <input checked="" type="checkbox"/> Fee Attached  <input type="checkbox"/> Amendment / Reply  <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s)  <input type="checkbox"/> Extension of Time Request  <input type="checkbox"/> Express Abandonment Request  <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> PTO/SB/08  <input type="checkbox"/> Certified Copy of Priority Document(s)  <input type="checkbox"/> Response to Missing Parts/Incomplete Application  <input type="checkbox"/> Basic Filing Fee  <input type="checkbox"/> Declaration/POA  <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s)  <input type="checkbox"/> Licensing-related Papers  <input type="checkbox"/> Petition  <input type="checkbox"/> Petition to Convert a Provisional Application  <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address  <input type="checkbox"/> Terminal Disclaimer  <input type="checkbox"/> Request for Refund  <input type="checkbox"/> CD, Number of CD(s)  <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC  <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences  <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)  <input type="checkbox"/> Proprietary Information  <input type="checkbox"/> Status Letter  <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <div style="border: 1px solid black; padding: 5px; min-height: 80px;">Return Postcard</div>
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Brent E. Vecchia, Reg. No. 48,011, Reg. No. 48,011 BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Signature	<i>Brent E. Vecchia</i>
Date	January 14, 2008

CERTIFICATE OF MAILING/TRANSMISSION			
I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.			
Typed or printed name	Brent E. Vecchia		
Signature	<i>Brent E. Vecchia</i>	Date	January 14, 2008



# FREE TRANSMITTAL for FY 2007

Patent fees are subject to annual revision.

Complete if Known

Application Number	10/815,607
Filing Date	March 31, 2004
First Named Inventor	James Christopher Matayabas, Jr.
Examiner Name	Geraldina Visconti
Art Unit	1752
Attorney Docket No.	42P18765

☐ Applicant claims small entity status. See 37 CFR 1.27.

TOTAL AMOUNT OF PAYMENT (\$)  
510.00

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ None ☐ Other (please identify): \_\_\_\_\_

☒ Deposit Account Deposit Account Number: 02-2666 Deposit Account Name: Blakely, Sokoloff, Taylor & Zafman LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Charge fee(s) indicated below, except for the filing fee  
☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR §§ 1.16, 1.17, 1.18 and 1.20. ☒ Credit any overpayments

## FEE CALCULATION

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
2053	130	2053	130	Non-English specification	
1251	120	2251	60	Extension for reply within first month	
1252	460	2252	230	Extension for reply within second month	
1253	1,050	2253	525	Extension for reply within third month	
1254	1,640	2254	820	Extension for reply within fourth month	
1255	2,230	2255	1,115	Extension for reply within fifth month	
1401	510	2401	255	Notice of Appeal	
1402	510	2402	255	Filing a brief in support of an appeal	510.00
1403	1,030	2403	515	Request for oral hearing	
1451	1,510	2451	1,510	Petition to institute a public use proceeding	
1460	130	2460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
1809	810	1809	405	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	810	2810	405	For each additional invention to be examined (37 CFR § 1.129(b))	
Other fee (specify) _____					
SUBTOTAL (2)					(510.00)

## SUBMITTED BY

Complete (if applicable)

Name (Print/Type)	Brent E. Vecchia, Reg. No. 48,011	Registration No. (Attorney/Agent)	48,011	Telephone	(303) 740-1980
Signature	<i>Brent E. Vecchia</i>			Date	01/14/08



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application. No. : 10/815,607

1<sup>st</sup> Named Inventor : Matayatas Jr.

Filed : 03/31/2004

Docket No. : 42P18765

Confirmation No. : 9674

TC/A.U. : 1752

Examiner : Geraldina Visconti

Customer No. : 7590

Mail Stop Appeal Brief-Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

APPEAL BRIEF  
IN SUPPORT OF APPELLANT'S APPEAL  
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

This brief is in furtherance of the Notice of Appeal, filed in the above-captioned case on November 12, 2007. Applicants (hereafter "Appellants") hereby submit this Brief (37 C.F.R. § 41.37). The fees required under § 41.20(b)(2), and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying Transmittal of Appeal Brief. Appellants respectfully request consideration of this appeal by the Board of Patent Appeals and Interferences for allowance of the above-captioned patent application.

An oral hearing is not desired.

01/17/2008 HMARZ11 00000030 022666 10015607  
01 FC:1402 510.00 DA

## TABLE OF CONTENTS

This brief contains these items under the following headings, and in the order set forth below (37 C.F.R. § 41.37(c)(1)):

I.	REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i)).....	3
II.	RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii)) ....	3
III.	STATUS OF THE CLAIMS (37 C.F.R. § 41.37(c)(1)(iii)) .....	3
IV.	STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv)) .....	4
V.	SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v)) ..	5
VI.	GROUND OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi)) .....	6
VII.	ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii)).....	7
VIII.	CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii)) .....	19
IX.	EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix)).....	23
X.	RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x)) .....	24

Page 18 of this brief bears the practitioner's signature.

**I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i))**

The real party in interest in this appeal is Intel Corporation of 2200 Mission College Boulevard, Santa Clara, California, 95052, to whom the invention is assigned.

**II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))**

With respect to other appeals or interferences that will directly affect, or be affected by, or have a bearing on the Board's decision in this appeal, to the best of Appellant's knowledge, there are no such appeals or interferences.

**III. STATUS OF THE CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))**

The status of the claims in this application are:

**A. TOTAL NUMBER OF CLAIMS IN APPLICATION**

Claims 2-8 and 49-54 are currently pending in the application.

**B. STATUS OF ALL THE CLAIMS**

1. Claims cancelled: 1 and 9-48
2. Claims withdrawn from consideration but not cancelled: 3-4,
3. Claims pending for examination: 2, 5-8, and 49-54
4. Claims allowed: NONE
5. Claims rejected: 2, 5-8, and 49-54

**C. CLAIMS ON APPEAL**

Claims 2, 5-8, and 49-54 are on appeal.

**IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))**

An Amendment to a Non-Final Office Action was filed on 6/8/07. The amendments were entered. A Final Office Action was mailed on August 14, 2007. No amendment has been filed after the Final Office Action was mailed. A copy of all claims on appeal is attached hereto in Section VIII as a Claims Appendix.

**V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))**

Claim 2 pertains to a composition, according to an embodiment of the invention. See e.g., Section II entitled “Epoxy Molding Compositions” (paragraphs [0037] through [0044]; Examples 5-7 on pages 21-22; and original claim 2. The composition includes a compound. See e.g., Section I entitled “Liquid Crystalline Epoxy Monomer Compounds” (paragraphs [0004] through [0036]); and original claim 1. The compound includes at least one epoxy group. See e.g., chemical formulas I and II; paragraphs [0004], [0015], [0016], and [0018]; and original claim 1. The compound also includes at least one liquid crystalline disrupting moiety. See e.g., paragraphs [0007] through [0011], [0014], [0024], and [0031]. A melting point temperature of the compound is less than 140°C. See e.g., paragraph [0013] and [0032]; and original claim 1. Liquid crystallinity of the compound at a temperature greater than 150°C. See e.g., paragraphs [0013] and [0032]; and original claim 1. The composition also includes a filler. See e.g., paragraphs [0037] and [0041]; and original claim 2. The filler has a coefficient of thermal expansion that is closer to a coefficient of thermal expansion of silicon than to a coefficient of thermal expansion of an epoxy medium in which the filler is employed. See e.g., paragraph [0041] and original claim 2.

**VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL**  
**(37 C.F.R. § 41.37(c)(1)(vi))**

- A. Claims 2, 5-8 and 49-54 are rejected under 35 U.S.C. § 112, First Paragraph, as allegedly failing to comply with the written description requirement.**
- B. Claims 2, 5-8 and 49-54 are rejected under 35 U.S.C. § 112, Second Paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**
- C. Claims 2, 5-8 and 49-54 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by any one of: (1) U.S. Patent Application Publication No. 2005/0041406, claim 25, (hereinafter Matayabas '406); (2) U.S. Patent Application Publication No. 2005/0287355, Figure 5, (hereinafter Matayabas '355); (3) U.S. Patent Application Publication No. 2005/0288454, Figure 2, (hereinafter Matayabas '454); or (4) U.S. Patent No. 6,924,027, claim 29, (hereinafter Matayabas '027).**



**VII. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))**

- A. Appellants respectfully submit that the rejection of claims 2, 5-8 and 49-54 under 35 U.S.C. § 112, First Paragraph, as allegedly failing to comply with the written description requirement, is improper.**

In making this rejection, the Examiner has asserted that *“The specification, as originally filed, does NOT support the invention as is now claimed, i.e., the composition containing the compound comprising at least one liquid crystalline disrupting moiety”*. Appellants respectfully disagree.

**Group I: Claims 2, 3-8, and 49-54**

There is amply written description for this limitation in the specification as originally filed. For example, there is ample written description for this limitation in paragraphs [0007] through [0011]. As discussed in paragraph [0007], *“X<sup>1</sup> connects the liquid crystalline moiety to a first aliphatic moiety (emphasis added), -(CH<sub>2</sub>)<sub>n1</sub>-, and X<sup>2</sup> connects the liquid crystalline moiety to a second aliphatic moiety (emphasis added), -(CH<sub>2</sub>)<sub>n2</sub>-.”*

As discussed in paragraph [0008], *“The aliphatic moieties (emphasis added) generally represent flexible hydrocarbon chains. The lengths of the chains are determined by n<sup>1</sup> and n<sup>2</sup>, which represent the number of carbon atoms in the first and second aliphatic moieties, respectively. .... When the number of carbon atoms exceeds about 20, the compounds may tend to have high viscosities, and the temperature range between the melting point and the isotropic point, or the temperature where properties become the same in all directions, may tend to diminish. Often, the melting point may tend to increase and the isotropic point may tend to decrease. This may tend to limit the range over which the compounds are liquid crystalline (emphasis added). In an embodiment where lower viscosities are appropriate, and where it is*

*appropriate to maintain more liquid crystalline character, it may be appropriate for  $n^1$  and  $n^2$  to be less than about 15.”*

As discussed in paragraph [0009], *“the flexible hydrocarbon chains may tend to disrupt the liquid crystalline characteristics of the compound (emphasis added). The amount of disruption of the liquid crystalline characteristics (emphasis added) generally increases with increasing length of the chains (i.e., greater  $n^1$  and  $n^2$ ). Without being bound by theory, it is believed that a long and flexible hydrocarbon chain may reduce the capability of the compounds to order”*

As discussed in paragraph [0010], *“Typically, disruption of the liquid crystalline characteristics of the compound (emphasis added) corresponds to a reduction in the melting point temperature of the compound”*

As discussed in paragraph [0011], *“In one embodiment of the invention,  $n^1$  and  $n^2$  may be selected to be sufficiently great to reduce a melting point of the compound to a desired extent by reducing the liquid crystalline character of the compound (emphasis added) due to the liquid crystalline moiety. Likewise,  $n1$  and  $n2$  may be selected to be sufficiently small to retain at least some liquid crystalline character of the compound in order to exploit low viscosity and other unique properties of liquid crystals.”*

Furthermore, other liquid crystalline disrupting moieties are shown and discussed. For example as discussed in paragraph [0014], *“In another embodiment of the invention, one or more halogens, such as fluorine, chlorine, bromine, or iodine, may optionally be substituted one-for-one with hydrogen.”* As another example, *“Depending upon the particular compound, even one or two t-butyl branches may tend to significantly disrupt liquid crystallinity”.*

As discussed in paragraph [0024], *“one or more of the  $R^1$  groups may be selected to be non-hydrogen groups, such as halogens or  $C_{1-3}$  alkyl groups. This may tend to disrupt the liquid*

*crystallinity of the compound (emphasis added) and reduce the melting point and isotropic transition temperatures. In general, the use of a large number of C<sub>1-3</sub> alkyl groups, or the use of several C<sub>3</sub> alkyl groups, may tend to significantly disrupt the liquid crystallinity (emphasis added)."*

As discussed in paragraph [0031], *"Based on the data in Table 1, a relatively greater disruption of liquid crystallinity (emphasis added) may be appropriate for a compound including phenyl, than for a compound including cyclohexane, for example. The greater disruption (emphasis added) may generally be achieved by including relatively more halogens or C<sub>1-3</sub> alkyl group optionally substituted with halogen in place of hydrogen. The greater disruption (emphasis added) may also generally be achieved by using larger C<sub>1-3</sub> alkyl groups, such as C<sub>2-3</sub> alkyl groups."*

Accordingly, clearly there is ample written description for the limitation of a liquid crystalline disrupting moiety in the specification as originally filed. Accordingly, Appellants respectfully submit that the rejection of claims 2, 5-8 and 49-54 under 35 U.S.C. § 112, First Paragraph is improper.

**B. Appellants respectfully submit that the rejection of claims 2, 5-8 and 49-54 under 35 U.S.C. § 112, Second Paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, is improper.**

In making this rejection, the Examiner has asserted only that “*Claim 2 is rejected as being vague and indefinite when it recites the composition containing the compound comprising ‘at least one liquid crystalline disrupting moiety’ (emphasis added); the specific group(s) encompassed by said moiety is not clear*”. As understood by Appellants, no further reasoning, analysis, or justification, was provided by the Examiner.

**Group II: Claims 2, 3-8, and 49-54**

Firstly, Appellants respectfully submit that the Examiner has failed to establish a *prima facie* case to support the rejection of claim 2 under 35 U.S.C. § 112, Second Paragraph. In particular, the Examiner has **not established** a *prima facie* case that **one of ordinary skill in the pertinent art**, when reading the claims, **in light of the supporting specification**, would not have been able to ascertain the claims with a reasonable degree of precision and particularity. See e.g., *Ex parte Wu*, 10 USPQ 2d 2031, 2033 (B.P.A.I. 1989). As discussed, above, the Examiner used no more than 3 lines of text to reject claim 2 under this section. Since the Examiner has not properly established that the claims are not ascertainable to one of skill in the art in view of the specification, or provided sufficient reasoning, the rejection is believed to be improper. Accordingly, Appellants respectfully request that the rejection be overturned on appeal.

Secondly, Appellants respectfully submit that claim 2 fully complies with the requirements of 35 U.S.C. § 112, Second Paragraph. Appellants respectfully submit that it is well established that **a compound and its properties are inseparable**. It is perfectly

permissible to claim a compound based in part upon its properties. There is no requirement to claim a compound solely based on its structure or specific groups as seemingly suggested by the Examiner in making this rejection.

Furthermore, the **specification provides numerous and sufficient teachings** of what is meant by a liquid crystalline disrupting moiety. It is taught that a liquid crystalline disrupting moiety is a moiety capable of disrupting liquid crystallinity in the compound. Numerous examples are given in the patent application. For example, aliphatic moieties are discussed in paragraphs [0007] through [0011]. Paragraph [0009] explains that *“The amount of disruption of the liquid crystalline characteristics generally increases with increasing length of the chains (i.e., greater n1 and n2). Without being bound by theory, it is believed that a long and flexible hydrocarbon chain may reduce the capability of the compounds to order”*. Various substitutions are discussed in paragraph [0014]. The use of groups such as halogens and C<sub>1-3</sub> alkyl groups are discussed in paragraph [0024]. Paragraphs [0025] through [0026] discuss other examples including epoxies. There are even broad statements about how to select a liquid crystalline disrupting moiety. For example, as discussed in paragraph [0026], *“In general, a longer and more flexible epoxy group may tend to reduce the liquid crystalline character of the compound, and may tend to reduce the melting point and isotropic transition temperatures”*. These are just a few illustrative examples. Other examples are disclosed in paragraphs [0030] to [0031] and [0033] through [0035].

Still other examples would be apparent to those skilled in the art and having the benefit of the present disclosure. Those skilled in the art of designing new compounds of the type claimed have a **fairly high level of skill** (e.g., at least a bachelors degree in chemistry or a related field). Accordingly, Appellants respectfully submit that they would appreciate the scope of the claim based on these detailed examples disclosed in the specification, the broad statements made in the specification, and what they already know of the art.

### **Group III: Claim 5**

Claim 5 recites that the compound of claim 2 has a particular formula as recited in claim 5. This formula even more particularly points out and distinctly claims the specific groups encompassed by the at least one liquid crystalline disrupting moiety. Paragraphs [0007] through [0011] discuss the liquid crystalline disrupting moieties in the formula. Accordingly, Appellants respectfully submit that the rejection of claim 5 under 35 U.S.C. § 112, Second Paragraph, is inappropriate.

### **Group IV: Claim 6**

Claim 6 recites that the compound of claim 2 has a particular formula as recited in claim 6. This formula even more particularly points out and distinctly claims the specific groups encompassed by the at least one liquid crystalline disrupting moiety. The liquid crystalline disrupting moieties in the formula are discussed in the specification. Accordingly, Appellants respectfully submit that the rejection of claim 6 under 35 U.S.C. § 112, Second Paragraph, is inappropriate.

### **Group V: Claim 7**

Claim 7 recites that the compound of claim 2 has a particular formula as recited in claim 7. This formula even more particularly points out and distinctly claims the specific groups encompassed by the at least one liquid crystalline disrupting moiety. The liquid crystalline disrupting moieties in the formula are discussed in the specification. Accordingly, Appellants respectfully submit that the rejection of claim 7 under 35 U.S.C. § 112, Second Paragraph, is inappropriate.

### **Group VI: Claim 8**

Claim 8 recites that the compound of claim 2 has a particular formula as recited in claim 8. This formula even more particularly points out and distinctly claims the specific groups encompassed by the at least one liquid crystalline disrupting moiety. The liquid crystalline disrupting moieties in the formula are discussed in the specification. Accordingly, Appellants respectfully submit that the rejection of claim 8 under 35 U.S.C. § 112, Second Paragraph, is inappropriate.

**C. Claims 2, 5-8 and 49-54 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by any one of:**

- (1) U.S. Pat. App. Pub. No. 2005/0041406 (hereinafter Matayabas '406), claim 25;**
- (2) U.S. Pat. App. Pub. No. 2005/0287355 (hereinafter Matayabas '355), Figure 5;**
- (3) U.S. Pat. App. Pub. No. 2005/0288454 (hereinafter Matayabas '454), Figure 2; or**
- (4) U.S. Patent No. 6,924,027 (hereinafter Matayabas '027), claim 29.**

**GROUP VII: CLAIMS 2, 5-8 and 49-54**

Appellants respectfully submit that U.S. Pat. App. Pub. No. 2005/0287355 (hereinafter Matayabas '355) and U.S. Pat. App. Pub. No. 2005/0288454, (hereinafter Matayabas '454) are not effective prior art to the present patent application under 35 U.S.C. § 102(e). As understood by Appellants, Matayabas '355 was first filed on June 25, 2004 and Matayabas '454 was first filed on June 25, 2004. However, the present patent application was first filed on March 31, 2004, which is before the June 25, 2004 filing date of Matayabas '355 and Matayabas '454. As understood by Appellants, in order for these references to be prior art under 35 U.S.C. § 102(e), the references should each have been "*filed in the United States before the invention by the Applicant for patent*". The invention by the Applicant for patent occurred before March 31, 2004. Accordingly, Appellants respectfully submit that Matayabas '355 and Matayabas '454 are not effective prior art to the present patent application under 35 U.S.C. § 102(e). Accordingly, Appellants respectfully request that the rejection on these references be overturned on Appeal.

Appellants respectfully submit that the present claims are not anticipated by U.S. Pat. App. Pub. No. 2005/0041406 (hereinafter Matayabas '406) or U.S. Patent No. 6,924,027 (hereinafter Matayabas '027).

Claim 2 pertains to:

*"A composition comprising:  
a compound comprising:*



*at least one epoxy group;*  
*at least one liquid crystalline disrupting moiety;*  
*a melting point temperature of the compound that is less than 140°C; and*  
*liquid crystallinity of the compound at a temperature greater than 150°C; and*  
*a filler having a coefficient of thermal expansion that is closer to a coefficient of thermal expansion of silicon than to a coefficient of thermal expansion of an epoxy medium in which the filler is employed”.*

Neither Matayabas ‘406 or Matayabas ‘027 disclose these limitations. In particular, neither Matayabas ‘406 or Matayabas ‘027 disclose “*a compound comprising: at least one epoxy group; at least one liquid crystalline disrupting moiety; a melting point temperature of the compound that is less than 140°C; and liquid crystallinity of the compound at a temperature greater than 150°C*”.

Matayabas ‘406 pertains to phase change thermal interface materials including polymer resins. See e.g., the Title. Matayabas ‘027 pertains to phase change thermal interface materials including exfoliated clay. See e.g., the Title.

Both Matayabas ‘406 or Matayabas ‘027 mention epoxies. However, neither Matayabas ‘406 or Matayabas ‘027 disclose the particular claimed compound. In particular, claim 2 makes it abundantly clear that in addition to the compound comprising the “*at least one epoxy group*” the compound also comprises “*at least one liquid crystalline disrupting moiety*”, “*a melting point temperature of the compound that is less than 140°C*”, and “*liquid crystallinity of the compound at a temperature greater than 150°C*”. Neither Matayabas ‘406 or Matayabas ‘027 disclose such a compound.

Firstly, neither Matayabas ‘406 or Matayabas ‘027 discusses “*liquid crystallinity*”. Simply put, there is absolutely no mention of the word “*liquid crystallinity*” in either of these references. Furthermore, neither Matayabas ‘406 or Matayabas ‘027 discusses a “*liquid crystalline disrupting moiety*”. Accordingly, there certainly is not explicit disclosure of a

compound including “*at least one epoxy group*”, having the claimed “*liquid crystallinity*”, and having “*at least one liquid crystalline disrupting moiety*”.

Secondly, neither Matayabas ‘406 or Matayabas ‘027 discusses a compound including “*at least one epoxy group*” and having the claimed “*melting point temperature*”. Matayabas ‘027 and Matayabas ‘406, respectively, discuss “*matrix resins*” and “*polyester matrix*” each having a melting point temperature that is “*typically less than about 130 °C*”. However, there is absolutely no disclosure that these “*matrix resins*” and “*polyester matrix*” also include “*at least one epoxy group*” let alone all of the other recited limitations of the claimed compound. In particular, column 6, lines 35-41 of Matayabas ‘027 mentions useful matrix resins including olefinic resins but does not mention that an epoxy would be a useful matrix resin. Likewise, paragraph [0023] and Examples 1 and 2 of Matayabas ‘406 mentions that polycaprolactone is a preferred polyester resin but does not mention that an epoxy would be a useful polyester resin. Accordingly, Appellants respectfully submit that there is absolutely no disclosure in Matayabas ‘027 or Matayabas ‘406 of the claimed compound having the “*at least one epoxy group*” and the claimed “*melting point temperature of the compound that is less than 140°C*”, let alone all of the other recited limitations of the claimed compound.

For at least one or more of these reasons, Appellants respectfully submit that neither Matayabas ‘027 or Matayabas ‘406 anticipates claim 2. Accordingly, Appellants respectfully request that the rejection of claim 2 be overturned on appeal. Claims 3-8 and 49-54 depend from claim 2 and would therefore also be allowable.

#### **GROUP VIII: CLAIM 5**

Claim 5 recites that the compound of claim 2 has the particular formula recited in claim 5. Neither Matayabas ‘027 or Matayabas ‘406 discloses this particular formula. Accordingly, Appellants respectfully submit that neither Matayabas ‘027 or Matayabas ‘406 anticipates claim

5. Accordingly, Appellants respectfully request that the rejection of claim 5 be overturned on appeal.

#### **GROUP IX: CLAIM 6**

Claim 6 recites that the compound of claim 2 has the particular formula recited in claim 6. Neither Matayabas '027 or Matayabas '406 discloses this particular formula. Accordingly, Appellants respectfully submit that neither Matayabas '027 or Matayabas '406 anticipates claim 6. Accordingly, Appellants respectfully request that the rejection of claim 6 be overturned on appeal.

#### **GROUP X: CLAIM 7**

Claim 7 recites that the compound of claim 2 has the particular formula recited in claim 7. Neither Matayabas '027 or Matayabas '406 discloses this particular formula. Accordingly, Appellants respectfully submit that neither Matayabas '027 or Matayabas '406 anticipates claim 7. Accordingly, Appellants respectfully request that the rejection of claim 7 be overturned on appeal.

#### **GROUP XI: CLAIM 8**

Claim 8 recites that the compound of claim 2 has the particular formula recited in claim 8. Neither Matayabas '027 or Matayabas '406 discloses this particular formula. Accordingly, Appellants respectfully submit that neither Matayabas '027 or Matayabas '406 anticipates claim 8. Accordingly, Appellants respectfully request that the rejection of claim 8 be overturned on appeal.

### CONCLUSION

Based on the foregoing, Appellants request that the Board overturn the rejection of all pending claims and hold that all of the claims of the present application are allowable.

Appellants respectfully petition for an extension of time to respond to the outstanding Office Action pursuant to 37 C.F.R. § 1.136(a) should one be necessary. Please charge our Deposit Account No. 02-2666 to cover the necessary fee under 37 C.F.R. § 1.17 for such an extension.

Please charge any shortages and credit any overpayment to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: 1/14/08

By Brent E. Vecchia  
Brent E. Vecchia, Reg. No. 48,011  
Tel.: (303) 740-1980 (Mountain Time)

1279 Oakmead Parkway  
Sunnyvale, California 94085-4040

**VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii))**

The text of the claims involved in the appeal are:

1. (Cancelled)

2. (Previously Presented) A composition comprising:

a compound comprising:

at least one epoxy group;

at least one liquid crystalline disrupting moiety;

a melting point temperature of the compound that is less than 140°C; and

liquid crystallinity of the compound at a temperature greater than 150°C; and

a filler having a coefficient of thermal expansion that is closer to a coefficient of thermal expansion of silicon than to a coefficient of thermal expansion of an epoxy medium in which the filler is employed.

3. (Withdrawn) A method comprising:

contacting a surface of a microelectronic device with the composition of claim 2; and

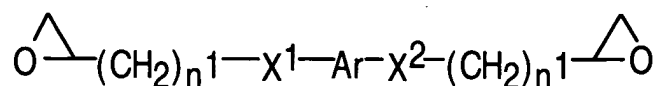
solidifying the composition on the surface.

4. (Withdrawn) A microelectronic device comprising:

a surface; and

a composition solidified on the surface by the method of claim 3.

5. (Previously Presented) The compound of claim 2, having the formula:



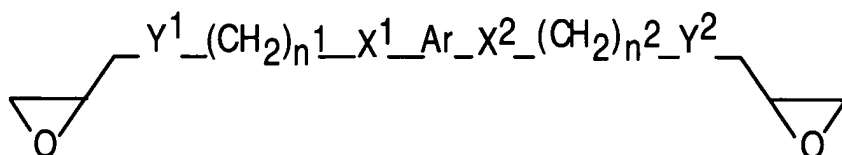
wherein

Ar includes a liquid crystalline moiety selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxy carbonyl)cyclohexdiyl, and diphenyl 1,4-cyclohexane-dicarboxylate;

X<sup>1</sup> and X<sup>2</sup> independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine; and

n<sup>1</sup> and n<sup>2</sup> independently of one another are numbers selected from 4 to 6.

6. (Previously Presented) The compound of claim 2, having the formula:



wherein

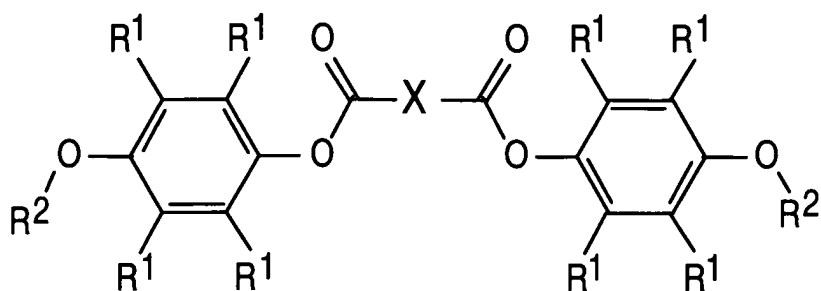
Ar includes a liquid crystalline moiety selected from trans-stilbenediyl, triphenyl, 1,4-bis(phenoxy carbonyl)cyclohexdiyl, diphenyl 1,4-cyclohexanedicarboxylate;

X<sup>1</sup> and X<sup>2</sup> independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine;

Y<sup>1</sup> and Y<sup>2</sup> independently of one another are selected from oxygen, carbonyl, carboxyl, oxycarbonyl, and amine; and

n<sup>1</sup> and n<sup>2</sup> independently of one another are numbers selected from 4 to 6.

7. (Previously Presented) The compound of claim 2, having the formula:



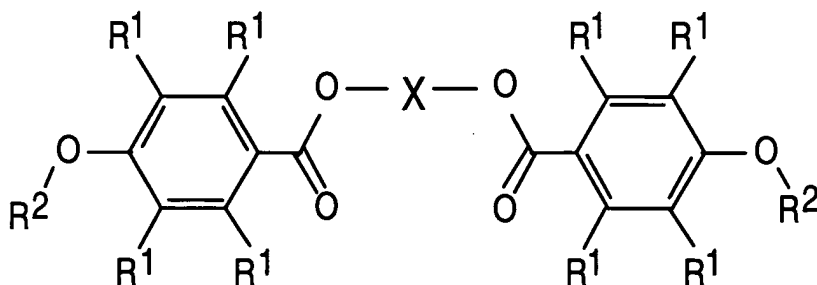
wherein

X is selected from a C<sub>6-10</sub> aryl group and a C<sub>5-10</sub> alicyclic group ;

each R<sup>1</sup> is independently selected from hydrogen, halogen, and C<sub>1-3</sub> alkyl optionally substituted with halogen, provided that not more than four of the R<sup>1</sup> are C<sub>2</sub> alkyl optionally substituted with halogen, and provided that not more than three of the R<sup>1</sup> are C<sub>3</sub> alkyl optionally substituted with halogen; and

each R<sup>2</sup> is independently selected from a C<sub>2-6</sub> epoxy.

8. (Previously Presented) The compound of claim 2, having the formula:



wherein

X is selected from a C<sub>6-10</sub> aryl group and a C<sub>5-10</sub> alicyclic group;

each R<sup>1</sup> is independently selected from hydrogen, halogen, and C<sub>1-3</sub> alkyl optionally substituted with halogen, provided that not more than four of the R<sup>1</sup> are C<sub>2</sub> alkyl optionally substituted with

halogen, and provided that not more than three of the  $R^1$  are  $C_3$  alkyl optionally substituted with halogen;

each  $R^2$  is independently selected from a  $C_{2-6}$  epoxy.

9. – 48. (Cancelled)

49. (Previously Presented) The composition of claim 2, wherein the coefficient of thermal expansion of the filler is matched to that of silicon.

50. (Previously Presented) The composition of claim 2, wherein the filler comprises one or more selected from silicon particles, silica particles, sand, quartz, silicon dioxide, and clay.

51. (Previously Presented) The composition of claim 2, wherein a weight percent of the filler in the composition ranges from 50 to 95 wt%.

52. (Previously Presented) The composition of claim 2, wherein the composition comprises an epoxy molding composition.

53. (Previously Presented) The composition of claim 2, further comprising:

a curing agent;

a curing accelerator; and

a curing inhibitor.

---

54. (Previously Presented) The composition of claim 2, wherein the filler comprises silicon.



**IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))**

To the best of Appellant's knowledge, no evidence has been submitted pursuant to 37 CFR Sections 1.130, 1.131, or 1.131.

**X. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x))**

(To the best of Appellant's knowledge, there are no related appeals or interferences.)